

## ABSTRACT

A planar extensible structure in a flat planar flex circuit can be extended out of the plane of the circuit by a distance of more than the width of the structure to carry fluids, electrical  
5 signals or optical signals into and out of the circuit. The planar extensible structure may be an Archimedes spiral, a parabolic spiral, a polygonal spiral, a non-spiral extensible shape, or other extensible shape. The invention can be used to siphon fluid samples from each well in a multiple-well microtiter plate into a microfluidic manifold for utility in chemical and biochemical analysis. The invention can also be used to allow electrical interconnect between  
10 adjacent circuits or circuit boards, and can allow signals carried in optical fibers to be transferred between optical circuits in different planes.